

Labor Market Transitions and Social Security in Colombia

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Abstract

This paper quantifies the magnitude of transitions across occupational categories in Colombia, a country with high unemployment and informality but quickly increasing its social security coverage for health. The analysis makes use of a panel of households between 2008 and 2009, representative of the main metropolitan areas in the country. Results confirm previous evidence found in Colombia and elsewhere in the region that transitions between occupations are large and asymmetric: they are disproportionately more likely to happen from formal to informal occupations than *vice versa*. The paper finds for the first time that such transitions are also different for salaried workers compared with the self-employed, as well as by poverty status of the worker. Salaried workers are more likely to transition first into

other salaried jobs, while self-employed are more likely to transition into unemployment or out of the labor force. There are marked differences in the profiles of transitioning and non-transitioning workers, both in terms of socioeconomic characteristics and social security coverage. Causal analysis shows that affiliation to social security on health deters occupational transitions, while pension insurance does not. Hence, high-volume transitions may not be crisis-specific phenomena, but rather associated with contributive and non-contributive social security mechanisms that incentivize informality, and workers' preferences for informal jobs. The debate on labor market and social security reforms needs to take these features of transitions into account.

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1. Introduction

Despite the growing evidence of the impacts of the global financial crisis on labor,² analyses on the volume and determinants of labor transitions are few and not recent. This paper addresses this knowledge gap focusing on Colombia, a country with one of the largest rates of unemployment and informality in Latin America, even before the global financial meltdown. According to the National Department of Statistics Administration (*Departamento Administrativo Nacional de Estadística*—DANE), there are more informal workers than formal salaried workers (excluding public workers). Also, the country ranks first in the region in terms of minimum wages and non-wage costs. Since the social security reform in 2002,³ labor market and social protection policies have been increasingly intertwined (Levy 2007 and 2008, Perry et al. 2007, Cunningham 2007 and Bernal et al. 2009), with important fiscal, productivity and growth repercussions. As a result, informality is believed by many researchers to be a preferred voluntary option for workers (as convincingly argued by Maloney 2004 and Perry et al. 2007 in the Latin American context), after comparing a social protection non-contributive system providing free health services and a contributive system with high levels of contribution (Cuesta and Olivera 2010). Others, such as Pagés and

² Khanna, Newhouse and Pacci (2010) show that for a sample of middle income countries (between 14 and 40, depending on the indicator), declines in employment rates between 2008 and 2009 were larger than declines in GDP growth rates, even though labor adjustments took place mainly through earnings. Specific to Latin America, these adjustments add to a grim picture of persistently high informality levels and structurally low labor earnings mobility in the region (Cuesta, Ñopo and Pizzolitto 2010). ILO (2009) estimates a total of 17 million unemployed in Latin America, surpassing the 13.7 million estimated for that year in the US (IADB 2010). ILO (2009) also reports large return inflows back into traditionally labor-sending countries such as India, Pakistan, Ecuador, El Salvador and East European countries. Furthermore, substantive internal migration within China from urban to rural areas of about 20 million people is estimated in 2009 alone.

³ Colombia has reduced significantly its historical gap with the region in terms of social spending, mainly due to sizeable increases in social security, which increased from 3 percent to 7 percent of GDP between the early 1990s and mid-2000s (CEPAL 2010).

Madrigal (2008), Perry et al. (2007), Camacho et al. (2009), Maloney (2004, 1999), Maloney and Bosch (2006), Maloney, Goni and Bosch (2007), Kugler and Kugler (2009), Mondragón et al. (2010), have shown that provisions of social protection, notably non-wage costs, incentivize informality. Only a few authors, such as Kugler and Kugler (2009), Mondragón-Velez, Peña and Wills (2010) and Camacho, Conover and Hoyos (2009), conduct econometric analysis of the occupational choice in Colombia, typically as an aggregated indicator in the economy or as a decision within firms and across sectors. To the best of our knowledge, no study analyses these effects either as an individual worker decision or within the context of transition or mobility trends.

This paper analyzes the magnitude, direction and composition of labor transitions in Colombia between 2008 and 2009, using recently available data from the latest two rounds of Fedesarrollo's Social Longitudinal Survey, FSLS (Fedesarrollo 2008, 2009), a household survey panel data representative of the 13 main metropolitan areas of the country. The paper also provides evidence on the personal and professional characteristics of those who transition across occupations and jobs, including their personal circumstances, motivations, preferences and exposure to and strategies against risks. Finally, the paper explores econometrically how these factors contribute to observed labor transitions. Even though the analysis does not establish causal links between the crisis and labor transitions, results confirm that between 2008 and 2009 there were large and asymmetric transitions among occupations in Colombia. Asymmetric transitions mask different mobility patterns across occupations: formal salaried workers may first try to move to the informal sector rather than transitioning into unemployment or out of the labor force, while an informal self-employed worker may more likely move into unemployment and out of the labor force. This result may be picking up not only period-specific labor dynamics but also a more structural phenomenon whereby workers voluntarily opt into salaried or self-employed occupations. Colombian workers appear relatively insensitive to a set of risks—even economic risks—during the

recent period of crisis. Interestingly, econometric analyses show that social security coverage is associated with reductions in the probability of occupational transitions, but pension and health insurance programs each have a different effect on the direction of the transition. These results on the volume of and motivations behind occupational transitions question the fiscal sustainability, economic efficiency and social protection capacity of the public strategy of generously increasing both social security and social assistance benefits.

2. Estimating Labor Transitions

Transition matrices are simple conceptual tools that capture movements of a given worker or group of workers from state “i” to state “j”. The term “state” may refer to sectors, occupations, activities and other feature of the labor market (well-paid jobs, decent jobs). As matrices become more disaggregated, groups may range from, for example, formal, informal or out of employment, and may also simultaneously include other features such as age, marital status or education (see Bosch and Maloney 2007). In its simplest form (see Cunningham, 2009), each KxK transition matrix cell provides information on the probability of individuals in a given group “i” moving to state “j” ($i,j=1\dots K$) out of the total number of individuals in that group potentially moving to state “j”:

$$T_{kk} = \left(P_{ij} = \frac{n_{ij}}{n} \right) \quad (1)$$

The simplicity of matrix (1) makes it the preferable tool to aggregated parametric estimates of mobility between two periods, as in Geweke et als (1986), or estimates through multiple periods, which typically revolve around a welfare indicator such as labor income (see Fields and Ok, 1999, Fields et al. 2007 and Cuesta, Ñopo and Pizzolito, forthcoming). When the analysis describes movements from one state to the other, the transition matrix described above is sufficient. Bosch and Maloney (2007) warn, however, that

those statistics—which they call “intensities”—should not be confused with “propensities”. Intensities refer to the probability of ending in each sector when all workers of a given sector were to leave it, that is, conditional on separation (see also Pages and Stampini, 2009). But this tells little about the underlying causes behind the moves, such as differentiated opportunities in the end sectors (in terms of absolute numbers or relative rate of openings) due to credit constraints, gender or cultural discrimination or changing business cycle demands. Nor does it cast light on supply issues embedded in the comparative advantages of certain workers (given their endowments and preferences) to work in specific sectors. The ability of the analysis to discern among such factors is very relevant to make inferences on how labor markets will react to shocks and policy reforms, or for testing hypotheses such as the voluntary nature of informality. Bosch and Maloney (2007) show for Argentina, Brazil and Mexico that when accounting for personal characteristics (worker’s age, education and gender) and expanding or declining business cycle demand, the traditional empirical finding of large asymmetries between formal and informal flows is reversed into much more symmetrical flows.

Unfortunately, at least two serious practical caveats are associated with transitional propensities. First, the continuous-time homogenous Markov process (with discrete-time panel observations, as in Bosch and Maloney 2007) assumes that the probability of an outcome is independent of the previous history of the process. In practice, that would indicate that the probability of two youths ending up in a formal job is independent of whether or not they worked previously or they were out of the labor market. Corrections to this caveat—as in mover-stayer models (Fougere and Kamioka 2003)—assume, instead, that there are individuals who never move away from their stationary state, while individuals in other groups are able to transition. While the concept is appealing—in the same way that the notion of chronic poverty vis-à-vis transitory poverty is—it may be hard to determine a priori which individuals pertain to which group. As well, these models do not capture mobility between formal and informal sectors if employment is a single

category vis-à-vis unemployment. See Fougere and Kamionka (2005) for a more detailed discussion regarding this point.

As a result, the key question this paper addresses is not about how to best infer the occupational structure in some future steady state or whether or not is reasonable to assume time-invariant Markov processes in contexts of crisis. Rather, the paper explores the size and magnitude of recent occupational transitions in Colombia and assesses the extent to which previous shocks, perceptions of future risk perceptions, and social security coverage affect such transitions in stress situations.

3. Data

In 2004, the Colombian think-tank Fedesarrollo, with the support of the Bogotá, Cali, and Bucaramanga chambers of commerce, converted a household survey in these three cities collected since 1999 into a rotating panel, fully renewed every four years. The 2008 phase saw a substantial increase in the sample size with the introduction of 10 additional cities (Medellín, Barranquilla, Manizales, Pasto, Pereira, Cúcuta, Ibagué, Montería, Cartagena, and Villavicencio) that form part of the “national urban total” defined by DANE for the calculation of unemployment figures. The first three cities represent 73 percent of the sample, while the other 10 represent the remaining 27 percent. The survey, carried out door-to-door to all household members present, is structured in several modules capturing individual labor market and social security records; access to social protection programs; risks, shocks and coping strategies; and housing, demographic and personal information.

The 2009 round of the survey maintains the same basic questionnaire and coverage of the 13 key metropolitan areas in the country. Some 80 percent of the 18,072 individuals surveyed in 2008 were also

interviewed in 2009. Importantly, the 2009 round incorporates additional detailed questions on labor transactions (from the last to the present job) and workers' affiliation to social security in healthcare and pensions (from the last change in status to the current one). That round also includes a detailed module on shocks during the last 12 months and the responses to them adopted by individuals and/or households. Shocks include economic downturns (such as unemployment or the unexpected loss of assets), health problems (such as illness or grave injury) or other types (for example, catastrophes or personal calamities such as marital separation or abandonment by an important household member). There is also a module on the perception of risks for the coming 12 months and the strategies—planned or executed—considered to confront these risks.

Unfortunately, a number of limitations in the design of the survey prevent a complete reconstruction of the labor history of working-aged individuals in the 12 months between the collections of the two stages. Each individual is asked whether he or she changed jobs during the last 12 months, but individuals are only asked to report the job previous to the current one. Thus, multiple episodes of mobility cannot be captured, but only the last move to the current job within the last 12 months. In addition, the set of additional questions regarding past labor status in the 2009 questionnaire is only available for individuals who were not interviewed in the last year and for salaried workers who were interviewed in 2008 but had been working for less than 12 months on their present job at the moment of the interview. For those salaried workers with tenure longer than 12 months, labor history can be re-constructed using recall data from the 2008 database, but for the rest (that is, self-employed, unemployed and out-of-labor force individuals interviewed in 2008 and again in 2009) is not possible to know what happened between the two interviews. These individuals represent 55.5 percent of the working-age sample. As a result, the findings in this paper are based on transitions with respect to the labor status at the time of the interviews in 2008 and 2009. Appendix 1 presents the basic summary statistics of the survey.

4. The Colombian Labor Market: Stylized Facts

Tables 1 and 2 report key stylized facts of the Colombian labor market. Unemployment rates estimated from the FSLS rounds reach 10.9 and 11.7 percent in 2008 and 2009 respectively, very similar to the official unemployment rates for the comparable 13 main metropolitan areas: 10.9 and 12.3 percent respectively (DANE 2010, p. 9). In 2008, labor market participation reached 54.4 percent, 66.3 percent among males and 44.5 percent among females in the working age (12 and older). By occupation, 60.3 percent (60.7 percent) of males (females) were salaried, 38.8 percent (37.1 percent) self-employed and 0.9 percent (2.2 percent) unpaid workers. By economic sector, some 51.8 percent of workers were occupied in services, followed by 40 percent in retail, manufactures and other sectors combined. About 27 percent of workers pertained to SISBEN 1 and 2.⁴ Only 38.8 percent of occupied workers were in the formal sector (defined in this paper as workers with pension and health insurance coverage).

The composition of the labor market does not change much in 2009 except for a marked decrease in the participation rate down to 51.1 percent, clearly associated with the crisis. Those most affected are males, although these changes do not substantially alter the existing gender gap in Colombia. Self-employment increases for both males and females, while construction and services drop their share in total occupation. In 2009, more workers pertain to SISBEN 1 and 2 categories than the previous year. Most interestingly, a significant proportion of Colombian workers report voluntarily choosing their employment category: 44

⁴ SISBEN is a means-tested targeting mechanism, categorizing households by socioeconomic condition based on a set of personal and household features and assets. The index goes from 1 to 6, where 1 is the poorest and 6 the richest. Social programs in Colombia typically consider eligible beneficiaries to individuals and/or households pertaining to SISBEN 1 and/or 2.

percent and 49 percent of the salaried and self-employed workers, respectively. This evidence is in line with findings reported in Perry et al. (2007), who argue that informality in Latin America is not a dominant exclusion phenomenon but, rather, one in which exclusion factors and voluntary selection of self-employment compete. This is also the case in Colombia, although Perry et al. (2007, p. 7) note that a larger-than-average proportion of self-employed workers in Colombia (this paper estimates 51 percent; Rentería 2007 estimates 60 percent) would prefer formal occupations vis-à-vis the Latin American region as a whole (about a third).

Table 1: Occupational Statistics

	2008	2009
Gender (%Total Population)		
Male	45.4	45.4
Female	54.6	54.6
Education Level (% Total Sample)		
Until Primary Complete	26.6	26.2
Until Secondary Complete	48.7	47.4
Tertiary or More	24.7	26.4
Age Group (% Total Sample)		
12 to 18	15.3	12.3
19 – 35	31.0	28.4
36 – 64	41.5	40.4
SISBEN Level (% Total Sample)		
1 or 2	27.3	29.8
3+	72.7	70.2
Working Age Population, WAP, (% Total Sample)	82.1	82.9
Economically Active Population, EAP, (% WAP)	55.4	51.9
Occupied People (% EAP)	89.1	88.3
Unemployed People (% EAP)	10.9	11.7
Inactive Population (% WAP)	44.6	48.1
Economic Sector (% Occupied People)		
Agriculture/Mining	1.2	1.3
Manufacturing	13.5	14.5
Construction	6.6	5.6
Retail	17.4	18.9
Services	51.8	48.5
Type of Occupation (% Occupied People)		

Formal Salaried	36.9	35.5
Informal Salaried	23.9	25.4
Formal Self-employed	3.1	2.2
Informal Self-employed	34.9	35.5
Unpaid Worker	1.2	1.3

Source: Authors' estimates from Fedesarrollo (2008, 2009) FSLs.

Notes: Official poverty lines are COP 269,362 and COP 281,384 per person in 2008 and 2009, respectively, according to MESEP (2010).

Table 2: Socioeconomic and Labor Characteristics of Formal and Informal Workers in Colombia

		2008					2009				
		Formal Salaried	Informal Salaried	Formal Self-employed	Informal Self-employed	Unpaid Worker	Formal Salaried	Informal Salaried	Formal Self-employed	Informal Self-employed	Unpaid Worker
Gender	Male	59.4	53.2	64.2	58.9	40.0	57.9	51.4	76.8	57.1	35.8
	Female	40.6	46.8	35.9	41.1	60.1	42.1	48.6	23.2	43.0	64.2
Education Level	Until Primary Complete	9.0	28.4	7.6	29.9	27.4	10.0	26.5	12.1	27.7	11.8
	Until Secondary Complete	44.1	53.0	38.6	45.2	46.6	42.7	50.3	32.3	46.0	55.9
	Tertiary or more	46.9	18.5	53.8	24.9	26.0	47.2	23.2	55.6	26.3	32.4
Age Group	12 to 18	0.7	5.1	0.7	1.7	8.2	0.6	4.3	0.0	1.3	13.2
	19 - 35	50.7	47.7	16.6	27.7	27.4	49.5	45.7	14.1	25.5	23.5
	36 - 64	48.2	45.0	75.9	62.9	49.3	49.4	47.5	81.8	65.0	52.9
Economic Sector	Agriculture/Mining	1.6	0.9	1.4	0.9	0.0	1.6	1.6	2.0	0.8	0.0
	Manufacturing	15.3	14.4	17.2	10.8	12.3	17.9	14.4	16.2	11.4	12.9
	Construction	2.5	9.3	4.8	9.1	2.7	2.7	7.0	7.1	7.4	2.9
	Retail	11.5	13.5	17.9	26.0	20.6	12.8	12.6	20.2	29.0	21.4
	Services	56.1	54.4	55.9	45.9	34.3	51.6	54.7	44.4	41.5	48.6
SISBEN Level	SISBEN 1 - 2	3.7	46.0	0.0	37.4	33.8	3.8	41.8	1.4	36.7	30.1
	SISBEN 3+	96.3	54.0	100.0	62.6	66.2	96.2	58.3	98.6	63.3	69.9
Poverty Level	Below or at	45.4	67.5	26.9	62.7	82.2	56.9	69.8	32.3	62.9	79.4
	Above	54.6	32.5	73.1	37.3	17.8	51.5	30.2	67.7	37.1	20.6

Source: Authors' estimates from Fedesarrollo (2008, 2009) FSLs.

Economic shocks increase for all categories, especially among formal workers, for whom their incidence during 2009 doubles with respect to the year 2008 (Table 3). Other categories also see increases in the vicinity of 50 percent with respect to levels in 2008. Interestingly, there is a (modest) decrease in the incidence of health shocks between both years across all categories. These findings point to distinctive dynamics of shocks by their nature. Also, despite the increase in the incidence of shocks expected from the crisis, perceptions about the risks of losing employment or incomes and risk of death have not changed from 2008 to 2009. This is especially true across formal workers. This may indicate that either

their perceptions are not consistent with at least short-term evidence, or that the intensity of previous shocks is not sufficient to modify their risk perceptions. This is consistent among labor groups.

Table 3: Incidence of Shocks and Perception of Risks Among Occupational Categories

Occupation	2008					2009				
	Past 12-month shocks (% of households with at least one shock)		Risk perception (1 = Not probable. 4 = Very probable)			Past 12-month shocks (% of households with at least one shock)		Risk perception (1 = Not probable. 4 = Very probable)		
	Economic	Health	Loss employment	Loss goods/money	Risk of death	Economic	Health	Loss employment	Loss goods/money	Risk of death
Formal Salaried	10.9	14.2	1.6	1.6	1.5	17.1	12.1	1.8	1.8	1.6
Formal Self-employed	11.7	13.1	1.5	1.5	1.4	20.2	11.1	1.8	1.6	1.5
Informal Salaried	16.8	15.8	1.7	1.7	1.5	22.6	13.3	1.8	1.9	1.6
Informal Self-employed	14.0	15.7	1.6	1.6	1.6	17.8	12.6	1.8	1.7	1.6
Unemployed	28.7	17.1	1.6	1.8	1.6	35.9	13.6	1.8	1.9	1.6
Out of labor force	13.3	17.8	1.7	1.7	1.5	17.2	16.4	1.8	1.7	1.6
TOTAL	14.3	16.5	1.6	1.7	1.5	19.1	14.5	1.8	1.8	1.6

Source: Authors' estimates from Fedesarrollo (2008, 2009) FSLs.

In addition to questions about their valuation and beneficiary status, individuals are also asked to report their knowledge of public social programs. Valuation is high on average—close to four out of five possible points—a finding common across all social programs, with little difference across occupational status (Table 4). Nor are large differences found between social security (health care and pension, whether contributive, non-contributive or private) and other programs of social protection and assistance. These results are consistent across individuals reporting to know either a lot or little about the programs they are asked to value and whether or not they are beneficiaries of such programs (results not shown).

Table 4: Reported Valuation of Social Security and Assistance Programs in Colombia

	2008			2009		
	Social Security programs*	Social Assistance programs**	All Programs	Social Security programs	Social Assistance Programs	All Programs
Formal Salaried	3.75	4.02	3.94	3.70	3.97	3.89
Formal Self-Employed	3.66	3.89	3.85	3.57	3.84	3.76
Informal Salaried	3.79	4.00	3.93	3.76	3.98	3.92
Informal Self-Employed	3.74	4.00	3.92	3.75	3.97	3.91
Unemployed	3.68	3.96	3.88	3.71	3.94	3.88
Inactive	3.77	4.01	3.93	3.77	3.99	3.92

Source: Authors' estimates from Fedesarrollo (2008, 2009) FSLs.

(*) Includes pensions, contributive health and non-contributive health insurance; (**) includes "Familias en Accion", ICBF, SENA, public schools, public universities, social interest housing, and "Cajas de Compensación Familiar"

5. Transition Matrices

This section looks in detail at transition flows, their taxonomy and their determinants. Initial estimates show that important occupational mobility asymmetries exist. One-third of "current" self-employed workers were salaried workers in their previous job vis-à-vis only 5 percent of "current" salaried workers moving from previous self-employment (see Table 5, Row 1). Gaviria (2004) also reports large asymmetric transitions for Colombia, in fact larger than those presented here: about 42 percent of formal workers changing jobs during the first quarter of 2004 ended up in informal occupations, while about 22 percent of informal workers changing jobs during the same period moved into a formal occupation. These results may differ, in part, due to a different survey used, the *Encuesta Continua de Hogares*; a different definition of informality (Gaviria uses the International Labor Organization's definition based on the size of enterprise); a shorter reference period compared (six months in Gaviria's paper rather than 12 months used in this paper); and a different year, 2004, a year of moderate growth after 2002 reforms partially liberalized the labor market while increasing formal contributions to pensions.

By looking at the sum of off-diagonal shares, Table 5 shows that some 81 percent of formal self-employed; 65 percent of informal salaried; 45 percent of informal self-employed and 35 percent of formal

salaried in 2008 ended up in other labor categories in 2009. For the most stable group, the unoccupied, some 85 percent of unoccupied workers in 2008 remained so in 2009. This higher immobility among the unoccupied is consistent with traditionally high unemployment rates in Colombia. Thus, although the economic crisis makes non-participation in the labor market more costly, the decline in labor demand associated with the crisis also makes participation more difficult.

Occupational transitions are asymmetric in nature. The proportion of salaried workers who transitioned between 2008 and 2009 from formality to informality was 10 percent, compared to 17 percent from informality to formality. Among the self-employed, some 45 percent transitioned from formality to informality, compared with 1.7 percent from informality to formality. Among transitioning workers who maintained their formality status but changed their occupation (that is, moved from formal salaried to formal self-employed, for example), numbers ranged from 0.8 percent to 17.4 percent. What these figures conceal, however, is that transitions among initially formal workers (that is, formal in 2008) took place *within* formal occupations and less so *between* occupation categories. Instead, those who in 2008 started as informal workers transitioned *between* occupational categories more so than *within* informal occupations. This evidence qualifies the original aggregated finding for an asymmetric mobility within the Colombian labor market: although it is typically less costly to move from formal to informal categories than *vice versa*, it also appears that formal workers may tend to move first across occupations within the formal sector rather than directly moving into informality. This may be because workers understand that it is more difficult to get back to formality once they enter the ranks of informality. Results show that salaried workers are more likely to become unoccupied than move into an informal salaried category by a factor of almost two to one.

Previously undocumented in the literature, we find that insurance transitions are also large and asymmetrical. Only one-third of workers who change jobs between 2008 and 2009 (nearly 54 percent of those employed in 2009) maintained full social security coverage in both periods, 27 percent maintained incomplete or no coverage, 13 percent gained insurance and the remaining 27 percent saw their situation worsen.

Table 5: Occupational Transition Matrices

		To 2009						Occupational Distribution
		Formal Salaried	Formal Self-Employed	Informal Salaried	Informal Self-Employed	Unemployed	Inactive	
From 2008	Formal Salaried	65.1	0.8	10.0	4.6	5.0	14.4	17.7
	Formal Self-Employed	12.7	19.0	7.8	45.8	2.8	12.0	1.4
	Informal Salaried	17.4	1.2	34.4	17.5	7.9	21.7	12.1
	Informal Self-Employed	3.6	1.7	14.2	54.8	4.8	20.9	17.2
	Unemployed	10.9	0.4	15.0	13.6	23.6	36.5	5.7
	Inactive	2.0	0.3	4.2	6.0	4.5	83.1	45.9
Occupational Distribution		15.9	1.0	11.2	16.5	6.1	49.2	100

Source: Authors' estimates from Fedesarrollo (2008, 2009) ELS

An additional question is how socioeconomic status affects the magnitude and direction of occupational transitions and transitional asymmetries. Several dimensions can capture socioeconomic status, and this study uses a simple characterization based on whether the household per capita income of a given individual is below or above the sample median of household per capita incomes. Using this simple measure is advisable for a number of reasons. First, other obvious alternatives are troublesome. For example, the means-tested targeting mechanism, SISBEN, categorizes households by socioeconomic condition based on a set of personal and household features and assets, but it is not regularly updated—certainly not between 2008 and 2009. A second alternative, the official poverty line, may not inspire sufficient confidence as there were structural changes in its calculation in 2006 when a new household survey, *Gran Encuesta Integrada de Hogares*, replaced the *Encuesta Permanente de Hogares* without

grandfathering.⁵ Third, any socioeconomic classification based on a distribution of labor earnings may be endogenous to the very transition that it is intended to capture, which can be reasonably assumed to be strongly (even if not exclusively) motivated by wanting to improve individual or household earnings. So can other categorizations based on consumer goods and assets that are collected in the Colombian survey and whose acquisition may also depend on increased disposable incomes after transitions take place. Of course, a relative poverty measure will not eliminate endogenous concerns, but to the extent that it limits the number of categories to analyze (only two categories, below or above the median, instead of five or ten as in income quintiles and deciles), biases should be less critical.

Results disaggregating transitions by category and poverty status confirm that poor and non-poor workers transition in different fashions (Table 6). For each category of informality and occupation, only the informal salaried, the informal self-employed and individuals out of the labor force have comparable diagonal results. In contrast, there are substantive differences in the relative proportions of those who did not transition among formal salaried, formal self-employed and unemployed. Among the former two, the non-poor in 2008 seem to have transitioned more than the poor, while the unemployed poor transitioned more than the non-poor. Results confirm a high volume of transitions when considering socioeconomic status. Again, the out-of-labor-force category is the most stable of all, followed by salaried workers (with non-poor being more stable than the poor). Very few of the remaining categories changed their labor condition. The magnitude of these transitions is not negligible and, again, transitions are asymmetric: a transitioning worker is more likely to remain within the same socioeconomic category in which the individual started in 2008 than to change socioeconomic status. A quarter of individuals moved into

⁵ As seen above (Table 1), classifications of workers based on SISBEN and poverty lines differ substantially (even though trends move in similar directions) given that the official poverty lines are well below the median of per capita household incomes in the sample: COP 281,384 and COP 850,999 respectively for 2009. Also, the estimated poverty incidence from the FSLs sample, at 70.5 percent, doubles the official poverty incidence for the 13 metropolitan areas, estimated by MESEP (2010) as 30.6 percent.

poverty (below the median per capita income) and about a third out of poverty (above the median). Between a quarter and half of all transitions take place within the same occupation category.⁶

Table 6: Occupational Transition Matrices by Occupation

	Labor status in 2009**											
	Poor formal salaried	Non-poor formal salaried	Poor informal salaried	Non-poor informal salaried	Poor formal self-employed	Non-poor formal self-employed	Poor informal self-employed	Non-poor informal self-employed	Poor unemployed	Non-poor unemployed	Poor out-of-labor force	Non-poor out-of-labor force
Labor status in 2008*												
Poor formal salaried	37.3	29.2	9.9	4.5	0.0	0.4	3.3	1.0	4.1	0.6	8.1	1.6
Non-poor formal salaried	8.3	56.3	1.7	6.6	0.1	0.9	1.2	3.6	3.1	2.0	8.0	8.2
Poor informal salaried	6.3	7.0	26.4	11.5	0.4	0.2	13.4	5.9	8.0	0.7	15.7	4.5
Non-poor informal salaried	2.0	19.0	4.9	26.4	0.3	1.4	5.3	10.5	3.6	3.6	10.8	12.1
Poor formal self-employed	2.8	11.1	2.8	5.6	0.0	11.1	22.2	19.4	2.8	0.0	16.7	5.6
Non-poor formal self-employed	0.0	12.3	0.9	6.6	3.8	17.9	11.3	35.9	1.9	0.9	2.8	5.7
Poor informal self-employed	1.5	2.1	8.8	6.0	0.6	0.6	36.9	16.5	4.6	0.8	19.0	2.8
Non-poor informal self-employed	0.0	3.7	2.0	11.6	0.5	1.8	13.7	42.6	2.3	1.9	8.5	11.6
Poor unemployed	3.2	5.2	9.0	7.7	0.0	0.3	10.0	4.2	19.5	6.0	26.2	8.7
Non-poor unemployed	0.6	16.3	3.0	7.8	0.0	0.6	1.8	10.2	9.6	9.6	10.8	29.5
Poor out-of-labor force	0.6	1.3	2.5	2.1	0.1	0.1	3.9	2.5	4.4	0.7	62.8	18.9
Non-poor out-of-labor force	0.1	2.1	0.7	2.7	0.1	0.2	1.1	4.1	1.3	2.3	25.5	59.8

Source: Authors' estimates from Fedesarrollo (2008, 2009) FSLs.

(*) 50th percentile of household per capita income distribution in 2009: COP 883,000 (**) 50th percentile in 2008: COP 850,999.

We further investigate how personal characteristics and circumstances affect labor transitions. Some 40 percent of labor transitions between 2008 and 2009 took place among individuals age 35 and 64, and two-thirds between 19 and 64 (Table 7). Females were more likely to transition than men (including transitions into unemployment and out of the labor force), and three-quarters of those transitioning had up to secondary education. Interestingly, one-third of individuals transitioning were household heads, while another third were their offspring. Marital status did not seem to strongly affect the likelihood of transitions: married and cohabitating individuals reported a similar proportion than single, divorced,

⁶ Appendix 2 reports the results of an alternative socioeconomic disaggregated transition analysis using the official poverty line estimated by MESEP (2010). The key results on volume and asymmetry of transitions do not change with the official definition of poverty, although there is an increase in relative terms of transitions into poor informal self-employed, poor informal salaried and poor formal salaried, and a decrease in transitions into non-poor informal self-employed, non-poor informal salaried and non-poor formal salaried.

separated or widowed. Transitioning individuals earn COP 795,000 on average, or 1.6 minimum wages, which is higher than individuals who did not transition, who earned an average of COP 612,000. That represented almost 30 percent higher earnings for the transitioning group, a statistically significant difference. But there was no difference in the total household per capita income of transitioning and non-transitioning individuals. Although it is hard to definitively conclude from this evidence—as other household members may or may not transition as well—it would appear consistent with labor decisions being taken at a household and not individual level in order to maximize their level of welfare (see Ashenfelter and Heckman 1974 for an early seminal argument). In any case, Table 7 also shows that the profile of non-transitioning individuals is typically statistically different from those who transition: younger, less educated (by one year of schooling) but without gender differences.

Table 7: Characteristics of Transitioning and Non-Transitioning Workers in Colombia

	[100%]		[100%]		
	Panel Sample (Transit and do not transit)	Transit	No Transit	Mean t-test (Transit Vs. Not transit)	
Age group (%)					
12 to 18	12.5	16.7	3.0	18.9	***
19 to 35	28.7	25.1	36.8	-12.2	***
35 to 64	40.3	39.2	42.8	-3.0	***
65 +	18.5	19.0	17.4	2.0	**
<i>Mean (years)</i>	40.7	41.3	39.3	5.3	***
Sex (%)					
Male	45.2	43.2	50.1	-6.4	***
Educational Achievement (%)					
Up to completed primary	26.4	24.2	27.4	4.9	***
Up to completed Secondary	49.1	47.3	49.9	2.0	**
More than Secondary	24.5	28.5	22.7	-7.4	***
<i>Mean (years)</i>	9.8	10.4	9.5	-9.4	***
Household Position (%)					
Head	32.6	31.8	34.7	-1.9	*
Spouse	20.4	20.7	19.7	1.6	
Child	32.8	32.6	33.4	-1.7	*
Other relative	12.5	13.2	10.7	3.3	***
Other Non-relative	1.7	1.8	1.6	-0.6	
Marital Status (%)					
Married	25.8	26.2	24.8	1.5	
Cohabitation	19.8	17.9	24.5	-6.7	***
Single	41.4	42.3	39.1	2.2	**
Separated	6.3	6.0	7.3	-3.2	***
Divorced	0.9	1.0	0.6	0.9	
Widowed	5.7	6.6	3.7	6.4	***
Monthly Individual Income (COP)					
Mean (in COP)	717,175	794,727	612,618	7.2	***
HH per capita income (COP)	588,563	596,372	585,144	0.7	
Household features (%)					
Own Household (payed or paying)	68.1	69.5	64.8	3.6	***
Type of floor					
<i>Soil or sand</i>	1.5	1.5	1.4	0.8	
<i>Gross wood</i>	4.9	5.2	4.2	1.6	
<i>Cement or gravel</i>	24.1	23.2	26.3	-3.3	***
<i>Floor tile</i>	65.1	65.5	64.4	0.9	
<i>Carpet, marble, parquet</i>	3.9	4.2	3.4	2.6	***
<i>Other</i>	0.5	0.5	0.4	0.2	
Household with car	15.7	16.3	14.5	2.8	***
Size					
<i>Less than 3</i>	24.6	25.4	22.9	3.3	***
<i>4 to 5</i>	45.9	46.2	45.2	0.7	
<i>6 to 10</i>	27.9	26.8	30.4	-4.0	***
<i>More than 10</i>	1.5	1.6	1.5	0.6	
Health Insurance (health module)					
Contributive Regime	49.2	50.7	46.1	4.3	***
Subsidized Regime	36.8	35.3	40.9	-5.1	***
ISS(Nueva EPS)	6.1	6.9	4.3	4.0	***
Other	2.5	2.8	1.8	3.6	***
Do not have insurance	5.0	4.3	6.9	-5.6	***
Pension Insurance					
Worker has coverage	27.5	27.4	46.3	12.5	***
Worker has no coverage	72.5	72.6	53.7	-12.5	***

Source: Authors' estimates from Fedesarrollo (2008, 2009) FSLs.

In addition to the personal transition profiles, the section also reports a simple causality analysis exploring which factors are more strongly associated with individual transitions (Table 8). Column 1 presents the results of a logit function that predicts the probability of observing a labor transition. Columns 2 to 4 show the results of a multinomial logit that predicts specific transitions into the categories of out of the labor force, unemployment, informality and formality. It is worth noting that this is the most encompassing model in terms of assumptions on labor decision-making and labor market structure. An alternative model would have implied that individuals first decide whether or not to transition, and conditional on transitioning, whether moving into informal or formal jobs. Other alternative might have assumed that there is some ranking associated with labor categories: from out of the labor force to unemployment, from unemployment to informality and from informality to formality. However, evidence above suggests that a significant proportion of individuals opt for self-employment and salaried categories rather than being forced into such jobs by some notion of hierarchy among occupations. As a result, a parsimonious specification that requires the least number of assumptions is preferred over alternative assumptions. Equation (2) presents the reduced form equation specification for the individual i 's probability of transitioning, the well known logistic function (see Kmenta 1986):

$$\ln \frac{P(T_i = 1)}{1 - P(T_i = 1)} = \alpha + \sum_{ij} (\beta_j X_j)_i \quad (2)$$

where $P(T_i=1)$ is the individual probability of transitioning—regardless of origin and host occupation categories—and X_j is the set of socioeconomic and demographic conditions of each individual and his or her household traditionally shown to affect labor supply decisions (see Killingsworth and Heckman 1986; Pencavel 1986), as well as the initial labor and social security status, two key variables of interest in this analysis.

Equation (3), in turn, presents the reduced form equation specification for individual transitioning that specifically defines the host occupation of the transitioning. That is, $P(T_i=k)$ accounts for the probability of transitioning into the k -th occupation category, i.e., transitioning into inactivity, unemployment, informality or formality, respectively:

$$\Pr(T_i = k) = \exp \left[\alpha_k + \sum_{ij} (\beta_j X_j)_i \right] / \sum_{k=1}^K \exp \left[\alpha_k + \sum_{ij} (\beta_j X_j)_i \right] \quad (3)$$

Results confirm several findings from transition matrices (Table 8, Column 1). Age increases the probability of transitioning but at a decreasing pace, the turning point being 42 years old. Education also has an inverted U pattern but it is not statistically significant. Household heads are less likely to transition than others household members. The occupational category in 2008 also plays a role into determining the 2009 labor status, consistent with the transition matrices results. Informal workers are more likely to transition than formal workers, but the formal self-employed are the most likely to transition and, as seen below, more so into inactivity rather than informal jobs. Being covered already by health insurance reduces the probability of transitioning, but pension coverage does not have an impact on that decision. Our constructed indicator for preference biases—capturing the degree of unbalance between a high valuation of a given program and a low level of knowledge about it—is not found to be statistically significant either. In other words, even when preferences may play a role in labor decisions, personal and labor circumstances remain dominating factors.

Table 8: A Model of Labor Transitions and Social Security in Colombia

	Logit	Multinomial Logit			
	transit/no transit	1 = transit into inactivity	2 = transit into unemployment	3 = transit into informality	4 = transit into formality
Age (years)	0.012 *** (0.002)	0.000 *** (0.000)	0.000 *** (0.000)	0.017 *** (0.002)	0.004 *** (0.001)
Age²	0.000 *** (0.000)	0.000 *** (0.000)	0.000 *** (0.000)	0.000 *** (0.000)	0.000 *** (0.000)
Years of education	0.002 (0.004)	0.000 (0.000)	0.000 (0.000)	-0.001 (0.003)	0.004 *** (0.001)
Years of education²	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Gender dummy (male =1)	0.011 (0.011)	0.000 *** (0.000)	0.000 (0.000)	0.026 *** (0.010)	0.010 *** (0.003)
Household size	0.001 (0.003)	0.000 (0.000)	0.000 (0.000)	0.001 (0.002)	-0.001 (0.001)
Household Position					
<i>Household head dummy (head = 1)</i>	-0.050 *** (0.017)	0.000 *** (0.000)	0.000 (0.000)	0.002 (0.015)	-0.013 *** (0.004)
<i>Spouse Dummy (Spouse = 1)</i>	-0.017 (0.019)	0.000 (0.000)	0.000 (0.000)	-0.018 (0.015)	-0.015 *** (0.004)
<i>Offspring dummy (Child = 1)</i>	0.012 (0.016)	0.000 (0.000)	0.000 (0.000)	0.013 (0.014)	-0.008 ** (0.004)
Previous Occupation					
<i>Dummy Unemployed_{t-1} = 1</i>	0.323 *** (0.026)	0.000 *** (0.000)	0.000 ** (0.000)	0.169 *** (0.025)	0.046 *** (0.012)
<i>Dummy Formal salaried_{t-1} = 1</i>	0.142 *** (0.022)	0.692 *** (0.095)	0.300 *** (0.095)	-0.149 *** (0.005)	-0.037 *** (0.003)
<i>Dummy Informal salaried_{t-1} = 1</i>	0.486 *** (0.018)	0.780 *** (0.076)	0.219 *** (0.076)	-0.144 *** (0.004)	-0.020 *** (0.002)
<i>Dummy Formal self-employed_{t-1} = 1</i>	0.617 *** (0.026)	0.817 *** (0.127)	0.183 (0.127)	-0.150 *** (0.004)	-0.025 *** (0.002)
<i>Dummy Informal self-employed_{t-1} = 1</i>	0.306 *** (0.020)	0.834 *** (0.055)	0.162 *** (0.054)	-0.152 *** (0.005)	-0.023 *** (0.002)
Social Security Status in Previous Occupation					
<i>Dummy Health Coverage_{t-1} = 1</i>	-0.045 ** (0.020)	0.000 * (0.000)	0.000 (0.000)	-0.029 * (0.017)	-0.002 (0.004)
<i>Dummy Pension Coverage_{t-1} = 1</i>	-0.002 (0.012)	0.000 ** (0.000)	0.000 (0.000)	-0.028 *** (0.010)	0.006 ** (0.003)
Preference bias (on Social Security)	-0.002 (0.007)	0.000 (0.000)	0.000 (0.000)	-0.007 (0.006)	-0.001 (0.002)
Preference bias (on Social Assistance)	0.016 (0.011)	0.000 (0.000)	0.000 (0.000)	-0.007 (0.009)	0.004 (0.003)
Number of observations	9,057	9,057	9,057	9,057	9,057
Wald Test	1369.95 ***				
Predicted Probability	25.85	0.00	0.00	15.49	2.60
Real Probability	29.19	5.43	2.95	15.25	5.60

Source: Authors' estimates from Fedesarrollo (2008, 2009) FSLs.

When looking at occupation-specific transitions (that is, moving into inactive, unemployed, informal and formal categories), as expected age describes an inverted U pattern among occupied workers and the opposite among the unoccupied (Table 8, Columns 2 to 4). The younger the individual, the more likely to be unemployed and/or out of the labor force; as he or she gets older the more likely he or she will find an occupation, but at a declining rate with age. Education reduces the chances of being out of the labor force, unoccupied or informal, but this effect is not statistically significant. Education increases the chances of transitioning into formality, and the effect is statistically significant. Men are more likely to be occupied (both informal and formally) and less likely to be out of the labor force (all statistically significant effects), but gender does statistically affect the probability of transitioning into unemployment.

Being occupied in 2008 increases the probability of transitioning out of the labor force, which is consistent with the high stability of out-of-labor-force categories reported by the transition matrices. The self-employed are more likely to move out of the labor force; however, salaried formal workers are more likely to move into unemployment. Being a formal worker reduces the chances of moving into informal categories, while being informal reduces the probability of moving into formal jobs.

Health coverage reduces the probability of a transition into informality, an effect that is statistically significant, but it does not increase the probability of becoming formal, unemployed or out of the labor force. Having pension coverage also reduces the probability of transitioning into informality and increases the probability of moving into formality (although the effect is ten times smaller than that for transitions into informality). Pension coverage does not significantly affect moving into unemployment or out of the labor force. Personal biases are not statistically significant either.

Finally, it is worth noting that the model provides a good fit predicting the observed transitions. It predicts 88 percent of truly observed transitions. It predicts a transition incidence of 26 percent of working age individuals in the sample, while the truly observed incidence is 29 percent.

6. Conclusions

This paper quantifies labor transitions in Colombia between 2008 and 2009, taking advantage of panel data collected throughout the crisis. Results confirm that in the context of the financial crisis, labor transitions remain large in Colombia and asymmetric in nature: a worker is more likely to move from formality to informality than *vice versa*, while an inactive individual is more likely to remain so than change his or her condition. This is consistent with previous evidence in Colombia. What the current analysis adds is that this asymmetry may mask different patterns across occupations. Salaried formal workers may first try to become salaried informal workers, rather than moving into unemployment or out of the labor force, while a self-employed informal worker may directly move into unemployment and out of the labor force.

Workers from low socioeconomic status transition less than workers with higher socioeconomic backgrounds, which may pick up the endogeneity of the decision to move—that is, moving in order to improve welfare conditions. The evidence also confirms that transitions may respond not only to an individual motivation to improve his or her condition, but may be part of a household strategy to maximize its welfare conditions. When looking at the profiles of those who transition and those who do not, the substantive differences in individual earnings between transitioning and non-transitioning workers vanish when comparing their total household per capita incomes.

Coupling this evidence of large, asymmetric, and socioeconomically distinctive transitions with coverage of social protection mechanisms provides a mixed picture. Results show that health coverage is associated with a lower probability of transitioning, especially into informal jobs, but pension coverage is not. Also, evidence shows that social protection coverage is not much related to expectations of protection against future risks: larger exposure to shocks does not affect the perception of future risks, regardless of being protected or not and regardless of having suffered past shocks, including economic and labor shocks in the context of the crisis.

From a policy point of view, these findings confirm previous results pointing to a similar valuation of social protection mechanisms among Colombians, as explained by Cuesta and Oliveira (2010), with a generalized perception that non-contributive schemes have a similar quality to contributive schemes, but are free for poor informal workers. In light of (i) similar valuations of formal and informal protection mechanisms, (ii) lack of awareness of the risk-protection roles of social security, (iii) strong preferences of workers for a certain occupation, and (iv) high-volume transitions, the public strategy of generous social benefits for both formal and informal workers is expected to increase subsidies from formal to informal workers—which ultimately de-incentivize formality—and add an increasing strain on the fiscal sustainability of social protection. The much-debated need for reforms of the labor and social protection system in Colombia must take into consideration the high volume of labor transitions, their nature and their motivations.

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Appendix 1: Summary Statistics of EFSL 2008 and 2009 Rounds

Variable	2008					2009				
	N	mean	sd	min	max	N	mean	sd	min	max
Age	10,141	39.6	19.0	12	99	9,476	40.9	19.0	12	100
Gender (% of males)	10,141	45.4	49.8	0	1	9,477	44.8	49.7	0	1
Years of education	9,856	9.8	4.9	1	26	9,856	9.8	4.9	1	26
Household Size	10,141	4.7	1.8	1	12	10,141	4.9	2.0	1	14
Proportion of occupied Workers (% Working Age People)	10,141	48.8	50.0	0	1	10,141	45.0	49.7	0	1
Proportion of unemployed people (% WAP)	10,141	5.6	23.1	0	1	10,141	6.1	23.9	0	1
Proportion of inactive people (%WAP)	10,141	45.6	49.8	0	1	10,141	48.9	50.0	0	1
Proportion of Salaried Workers (% Occupied Workers)	4,949	60.5	48.9	0	1	4,559	59.7	49.0	0	1
Proportion of Self-Employed People (% Occupied Workers)	4,949	38.0	48.6	0	1	4,559	38.7	48.7	0	1
Proportion of Unpaid Workers (% Occupied Workers)	4,949	1.5	12.1	0	1	4,559	1.5	12.1	0	1
"Obligated" Salaried Workers (% Salaried Workers)	2,993	55.9	49.7	0	1	2,723	56.7	49.6	0	1
"Obligated" Self-Employed People (% Self-Employed People)	1,883	50.2	50.0	0	1	1,763	48.3	50.0	0	1

Source: Authors' estimates from Fedesarrollo (2008, 2009) FSLs.

Appendix 2: Occupational Transitions Disaggregated by Official Poverty Status

	**Labor status in 2009											
	Poor formal salaried	Non-poor formal salaried	Poor informal salaried	Non-poor informal salaried	Poor formal self-employed	Non-poor formal self-employed	Poor informal self-employed	Non-poor informal self-employed	Poor unemployed	Non-poor unemployed	Poor out-of-labor force	Non-poor out-of-labor force
Labor status in 2008 *												
Poor formal salaried	50.3	13.7	11.2	2.2	0.3	0.1	3.2	0.5	4.7	0.1	12.6	1.0
Non-poor formal salaried	15.1	51.0	2.2	5.0	0.2	0.9	1.8	3.6	3.5	1.6	9.8	5.3
Poor informal salaried	12.5	3.8	30.2	5.9	0.2	0.1	16.1	2.3	7.5	0.5	19.9	1.0
Non-poor informal salaried	3.8	15.8	13.8	17.1	0.3	2.6	6.6	8.9	5.9	2.0	14.8	8.4
Poor formal self-employed	5.3	7.9	7.9	5.3	5.3	5.3	29.0	7.9	5.3	0.0	15.8	5.3
Non-poor formal self-employed	1.0	11.5	1.0	4.8	4.8	17.3	20.2	28.9	1.9	0.0	5.8	2.9
Poor informal self-employed	2.9	1.1	13.6	2.6	0.5	0.2	39.9	11.2	5.5	0.0	21.3	1.2
Non-poor informal self-employed	0.2	2.8	4.2	6.6	1.1	2.3	20.2	40.8	2.0	1.6	10.5	7.8
Poor unemployed	5.9	4.0	12.8	2.7	0.0	0.2	10.7	2.3	23.2	1.3	32.8	4.0
Non-poor unemployed	0.0	16.3	4.4	7.6	0.0	1.1	5.4	10.9	13.0	6.5	18.5	16.3
Poor out-of-labor force	1.1	0.8	3.4	1.1	0.1	0.1	4.8	1.3	4.9	0.3	73.4	8.8
Non-poor out-of-labor force	0.5	1.8	0.9	2.3	0.1	0.3	1.8	3.6	1.5	0.9	36.4	49.9

*Poverty line taken from the MESEP in 2008 COP 269,362 (per capita value)

**Poverty line taken from the MESEP in 2009 COP 281,384 (per capita value)